DOCUMENT RESUME

ED 290 359 HE 020 928

AUTHOR Farquhar, Robin H.
TITLE Technology and Universities.
PUB DATE 13 May 87
NOTE 11p.; Paper presented at the Canadian Information Processing Society's Congress '87, "Technology for People" (Winnipeg, Manitoba, Canada, May 13, 1987).
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Administration; College Libraries; College Planning; College Role; *Computer Oriented Programs; Data Processing; *Higher Education; Research; School Registration; *Social Change; *Technological Advancement; *Technology Transfer
IDENTIFIERS *University of Winnipeg (Canada)

ABSTRACT

The role of the university as a promoter and user of technology is discussed, along with the university's role as observer and critic of technology. Examples of how the university uses technology are provided, including registration, research, library operations, energy conservation, planning, and management. Questions that have been posed about technology by higher education include: whether technology will replace judgment, intuition, and responsibility; whether technology will reduce interpersonal contact; whether technology will discourage divergent thinking, originality, and imagination; whether technology will smother individuality and blur individual differences; whether technology will retard physical development, limit outdoor activity, and frustrate aesthetic expression; and whether technology will exacerbate inequities. Based on the experience of the University of Winnepeg, examples are cited of the relationship between university uses of technology and criticisms of it. Some positive answers were found, among them that: the use of technology in registration has improved access and choice of courses; technology has enhanced distance education; and technology has improved library operations. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED290359

TECHNOLOGY AND UNIVERSITIES

By

Robin H. Farquhar

President

The University of Winnipeg

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Robin H. Farquhar

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Presented at the

Canadian Information Processing Society's

Congress '87 -- "Technology for People"

Winnipeg, Manitoba

May 13, 1987

BEST COPY AVAILABLE

HE 020 928

TECHNOLOGY AND UNIVERSITIES

I AM VERY PLEASED WITH THIS OPPORTUNITY TO SPEAK TO YOU BRIEFLY THIS AFTERNOON AND TO ADD MY WORD OF WELCOME ON THIS OCCASION OF YOUR FIRST CONGRESS IN WINNIPEG. I NOTE THAT YOUR THEME IS "TECHNOLOGY FOR PEOPLE," AND I HAVE BEEN INVITED TO COMMENT ON THAT THEME FROM THE POINT OF VIEW OF A UNIVERSITY PRESIDENT. IT HAS BEEN SUGGESTED THAT, WITH TWO CORPORATE LEADERS AS YOUR LUNCHEON SPEAKERS YESTERDAY AND TOMORROW, I MIGHT CONTRIBUTE BY BRINGING A NON-BUSINESS PERSPECTIVE TO YOUR DELIBERATIONS. I FIND THIS A BIT IRONIC BECAUSE I AM RESPONSIBLE FOR MANAGING A RATHER COMPLEX ORGANIZATION WITH AN ANNUAL CASH FLOW OF ALMOST $30 MILLION, A PAYROLL OF MORE THAN 500, ASSETS OF CLOSE TO $80 MILLION, AND A CLIENTELE BASE OF ABOUT 10,000 DAILY (AND THE UNIVERSITY OF WINNIPEG IS CONSIDERED TO BE RELATIVELY SMALL BY CANADIAN STANDARDS); WHILE WE ARE NOT A PROFIT-MAKING ENTERPRISE, WE ARE FORBIDDEN TO RUN DEFICITS - WHICH REQUIRES THE APPLICATION OF SOME RATHER BUSINESS-LIKE SKILLS.

CONSEQUENTLY, THE UNIVERSITY'S APPROACH TO TECHNOLOGY IN SOME WAYS RESEMBLES THAT OF BUSINESS - WE VIEW IT AS A SET OF TOOLS THAT CAN HELP US IMPROVE OUR EFFECTIVENESS AND EFFICIENCY IN PURSUING OUR OBJECTIVES. WE DO, HOWEVER, APPROACH TECHNOLOGY IN ANOTHER WAY AS WELL: ONE OF THE UNIVERSITY'S CHIEF ROLES IN SOCIETY IS TO SERVE AS AN OBJECTIVE CRITIC - AN ASKER OF QUESTIONS - AND IT WOULD NOT BE RESPONSIBLE FOR US TO ALLOW TECHNOLOGY TO ESCAPE THE EXERCISE OF THAT ROLE. SO THE UNIVERSITY'S APPROACH TO TECHNOLOGY MAY BE DESCRIBED AS A BIT SCHIZOPHRENIC - ON THE ONE HAND, WE ARE PROMOTERS AND USERS OF IT; AND ON THE OTHER HAND, WE ARE OBSERVERS AND CRITICS OF IT. WHAT I'D LIKE TO DO THIS AFTERNOON IS ELABORATE A LITTLE ON EACH OF THOSE

. . . 2/

APPROACHES AND THEN CONCLUDE WITH A FEW COMMENTS ON THE RELATIONSHIPS BETWEEN UNIVERSITY USES AND CRITICISMS OF TECHNOLOGY.

The University as a Promoter and User of Technology

The university, like most business organizations and more than many of them, is a user and promoter of technology. Let me give you a few illustrations that are common on most campuses across this country:

In Registration - We offer hundreds of courses, many with several sections each, the subjects of which must be based on content that we (or others) believe should be taught, the interests and needs of students, academic specializations of faculty we employ, and available back-up resources such as library holdings, scientific equipment, and technical support personnel. What courses we teach are further constrained by such factors as the workload of individual professors, prerequisites and required sequences of offerings, different maximum enrollments that are suitable for different types of courses, the varying sizes and configurations of our hundreds of teaching areas, the number of operating days per academic year and hours per day, and the length and frequency of sessions that are appropriate for different classes. Then there are certain priorities that a university may wish to factor in from time to time - such as preference for Manitoba students, quotas for international students, special provisions for Native or mature students, etc. Somehow, all of these

. . . 3/

VARIABLES MUST BE FULLY AND ACCURATELY PROCESSED AT THE MOMENT WHEN ONE OF OUR 8,000 STUDENTS STEPS UP TO THE FRONT OF THE REGISTRATION LINE OR PICKS UP THE PHONE TO REGISTER BY TOUCH-TONE. WITHOUT TECHNOLOGY, WE WOULD OBVIOUSLY EXPERIENCE SHEER CHAOS.

IN RESEARCH - IT IS WELL KNOWN THAT SOPHISTICATED INFORMATION-PROCESSING TECHNOLOGY HAS BECOME ESSENTIAL TO THE CONDUCT OF RESEARCH IN BOTH THE SOCIAL AND THE NATURAL SCIENCES. THE QUESTIONS TO WHICH WE NOW NEED ANSWERS THROUGH RESEARCH ARE SIMPLY TOO COMPLEX TO ADDRESS WITHOUT THE AID OF HIGH-POWER COMPUTING, AND THIS IS TRUE AS WELL OF INVESTIGATIONS IN MOST PROFESSIONAL FIELDS SUCH AS AGRICULTURE, LAW, MEDICINE, BUSINESS, ENGINEERING, AND ARCHITECTURE. MANY UNIVERSITIES, IN FACT, HAVE NOW TAKEN THE NEXT LOGICAL STEP WHICH IS THE ESTABLISHMENT OF TECHNOLOGY TRANSFER CENTRES TO FACILITATE THE APPLICATION AND COMMERCIALIZATION OF RESEARCH RESULTS. WHAT IS PERHAPS NOT SO WELL RECOGNIZED IS THE USE OF TECHNOLOGY FOR RESEARCH IN CERTAIN ARTS AND HUMANITIES AREAS - COMPUTER-ASSISTED DESIGN IN SCULPTURE AND PAINTING, MUSICAL COMPOSING WITH THE AID OF COMPUTERS, INSTANT TRANSMISSION OF WORK-IN-PROGRESS BY CREATIVE WRITERS, AND COMPUTER-BASED ANALYSIS OF LANGUAGE USAGE BY LITERARY SCHOLARS, FOR EXAMPLE.

IN LIBRARIES - AS KNOWLEDGE EXPANDS EXPONENTIALLY, SO DO THE PUBLICATIONS IN WHICH IT IS RECORDED AND THE COLLECTIONS

. . . 4/

OF LIBRARIES IN WHICH THEY ARE HELD. BECAUSE UNIVERSITY LIBRARIES ARE ONLY USEFUL IF THEY CAN BE ACCESSED QUICKLY AND EASILY, TECHNOLOGY HAS BECOME ESSENTIAL TO THEIR OPERATION. MICROCOMPUTERS, IN PARTICULAR, ARE NOW ROUTINELY USED FOR SUCH BASIC FUNCTIONS AS CATALOGUING, REFERENCE SERVICES, INTER-LIBRARY LOANS, ON-LINE BIBLIOGRAPHIC SEARCHING, JOURNAL EDITING, AND SELECTED DISSEMINATION OF INFORMATION SYSTEMS.

IN ENERGY CONSERVATION - WE ESTIMATE THAT OUR COMPUTERIZED HEATING AND COOLING SYSTEMS, WHICH CAN BE PROGRAMMED TO AUTOMATICALLY KEEP HUNDREDS OF DIFFERENT ROOMS AT DIFFERENT TEMPERATURES DURING DIFFERENT TIMES OF THE DAY AND YEAR, HAVE REDUCED OUR ENERGY CONSUMPTION COSTS TO ABOUT ONE-HALF OF WHAT THEY WERE BEFORE COMPUTERIZATION.

IN PLANNING - EACH YEAR, AND ON A MULTI-YEAR BASIS, STRATEGIC DECISIONS MUST BE MADE ABOUT ADMISSION REQUIREMENTS, SALARY ADJUSTMENTS, AND TUITION FEES. THESE DECISIONS DEPEND IN PART ON SUCH VARIABLES AS GRANTS FROM GOVERNMENTS AND OTHER SOURCES, ACADEMIC PROGRAM DEVELOPMENT, SALARY INCREASES ELSEWHERE, INFLATION IN NON-SALARY ITEMS, DEMOGRAPHIC TRENDS, AND PARTICIPATION RATES. BECAUSE MANY OF THESE FACTORS INTERACT WITH ONE ANOTHER, VARIATIONS IN ONE WILL CAUSE OR RESULT FROM VARIATIONS IN ANOTHER AND THEY ARE SUBJECT TO MANIPULATION FOR STRATEGIC PURPOSES. THIS KIND OF MANIPULATION, WHICH IS CRUCIAL FOR SOUND DECISION-MAKING, WOULD BE IMPOSSIBLE

. . . 5/

WITHOUT THE SIMULATION CAPABILITIES OF COMPUTER MODELING.

IN MANAGEMENT - AS IN MOST MODERN BUSINESSES, THE COMPUTER HAS BECOME INDISPENSIBLE FOR ADMINISTRATIVE PURPOSES IN UNIVERSITIES. INTEGRATED, AUTOMATED OFFICES (WITH ELECTRONIC-DATA TRANSMISSION AND WORD-PROCESSING CAPABILITIES), MANAGEMENT INFORMATION SYSTEMS (FOR FINANCIAL PROJECTIONS, INVENTORY CONTROL, AND RECORDS ADMINISTRATION), AND COMPUTERIZED SCHEDULING (FOR SPACE, COURSES, AND EQUIPMENT) ARE OBVIOUS EXAMPLES OF TECHNOLOGY APPLICATION IN UNIVERSITY MANAGEMENT.

IN TEACHING - COMPUTER-ASSISTED AND COMPUTER-MANAGED INSTRUCTION FACILITATE OUR TEACHING IN MANY FIELDS THAT LEND THEMSELVES TO PROGRAMMED LEARNING. COMPUTER LITERACY IS AN OBJECTIVE THAT SEVERAL UNIVERSITIES NOW PURSUE FOR ALL THEIR STUDENTS, AND COMPUTER MASTERY IS NECESSARY FOR THOSE SPECIALIZING IN HIGH-TECHNOLOGY AREAS. AND THE MARRIAGE OF COMPUTING AND COMMUNICATION TECHNOLOGIES HAS FOSTERED TREMENDOUS TEACHING ADVANCES IN OUR DISTANCE EDUCATION PROGRAMS.

THERE CAN BE LITTLE DOUBT, THEN, THAT UNIVERSITIES ARE HIGH-FREQUENCY PROMOTERS AND USERS OF TECHNOLOGY.

THE UNIVERSITY AS AN OBSERVER AND CRITIC OF TECHNOLOGY

OUR OTHER APPROACH TO TECHNOLOGY IS IN OUR TRADITIONAL ROLE AS OBJECTIVE OBSERVERS AND CONSTRUCTIVE CRITICS OF DEVELOPMENTS IN THE WORLD AROUND US. IN GENERAL, WE HAVE PLAYED THIS ROLE WITH RESPECT TO TECHNOLOGY BY EXPRESSING CONCERN ABOUT ITS APPARENT

. . . 6/

CONCENTRATION ON SCIENTIFIC, TECHNICAL, AND ECONOMIC PURPOSES AND ITS RELATIVE UNDER-EMPHASIS ON CULTURAL AND POLITICAL EFFECTS, SOCIAL AND PSYCHOLOGICAL IMPACTS, AND LEGAL AND ETHICAL IMPLICATIONS IN SUCH MATTERS AS SECURITY, PRIVACY, AND COPYRIGHT. MORE SPECIFICALLY, THESE CONCERNS HAVE TAKEN THE FORM OF QUESTIONS SUCH AS THE FOLLOWING:

- WILL TECHNOLOGY REPLACE JUDGEMENT, INTUITION, AND RESPONSIBILITY? THERE ARE CONCERNS THAT THE IMPORTANCE OF SPIRITUAL, ETHICAL, AND VALUE DIMENSIONS OF HUMAN BEHAVIOUR WILL DECLINE, THAT THE ROLE OF FEELINGS AND EMOTIONS WILL BE DOWNPLAYED, AND THAT SELF-DISCIPLINE AND INTEGRITY MAY TAKE A BACK SEAT TO TECHNOLOGICALLY-INDUCED EXPEDIENCY.
- WILL TECHNOLOGY REDUCE INTERPERSONAL CONTACT? THERE ARE CONCERNS THAT THE VALUES OF NON-VERBAL COMMUNICATION, HUMAN RESPONSIVENESS, AND A SENSE OF COMMUNITY WILL BE LOST AS MUCH THAT USED TO REQUIRE PEOPLE GETTING TOGETHER CAN NOW BE DONE BY MACHINE.
- WILL TECHNOLOGY DISCOURAGE DIVERGENT THINKING, ORIGINALITY, AND IMAGINATION? THERE ARE CONCERNS THAT THE ADVENT OF ARTIFICIAL INTELLIGENCE, EXPERT SYSTEMS, AND ROBOTICS WILL REMOVE THE MOTIVATION FOR UNCONVENTIONAL THOUGHT AND INNOVATIVE PROBLEM-SOLVING.
- WILL TECHNOLOGY SMOTHER INDIVIDUALITY AND BLUR INDIVIDUAL DIFFERENCES? THERE ARE CONCERNS THAT THE BROAD APPLICATION OF PROGRAMMED CAPABILITIES WILL PROMOTE

. . . 7/

SIMILAR BEHAVIOUR AMONG PEOPLE AND REDUCE THE PRECIOUS VARIABILITY THAT DISTINGUISHES ONE PERSON FROM ANOTHER.

- WILL TECHNOLOGY RETARD PHYSICAL DEVELOPMENT, LIMIT OUTDOOR ACTIVITY, AND FRUSTRATE AESTHETIC EXPRESSION? THERE ARE CONCERNS THAT THE CONVENIENCE OF INTELLECTUALLY-BASED TECHNOLOGIES IN THE HOME AND WORKPLACE MAY CAUSE PEOPLE TO CONCENTRATE THEIR ENERGIES ON COGNITIVE ACTIVITIES IN THOSE LOCATIONS RATHER THAN GETTING OUT AND EXPRESSING THEMSELVES MORE FULLY.
- WILL TECHNOLOGY EXACERBATE INEQUITIES? THERE ARE CONCERNS THAT THE READIER AVAILABILITY OF TECHNOLOGY TO SOME THAN TO OTHERS WILL, IN EFFECT, RESULT IN GREATER DISCRIMINATION ACCORDING TO DEMOGRAPHIC OR SOCIO-ECONOMIC STATUS, REGIONAL OR INTERNATIONAL DIFFERENCES, AND GENDER- OR AGE-BASED VARIABLES.

I BELIEVE THAT ALL OF THESE QUESTIONS AND CONCERNS ARE LEGITIMATE, AND IT IS APPROPRIATE FOR UNIVERSITIES (AND OTHERS, FOR THAT MATTER) TO RAISE THEM IN THE FACE OF OUR UNSTOPPABLE TECHNOLOGICAL DEVELOPMENT.

THE RELATIONSHIPS BETWEEN UNIVERSITY USES AND CRITICISMS OF TECHNOLOGY

I THINK YOU'LL BE PLEASED TO KNOW THAT, WHEN I APPLY THESE QUESTIONS TO RECENT ADVANCES IN TECHNOLOGY RIGHT AT HOME ON OUR OWN CAMPUS, THE ANSWERS I COME UP WITH ARE GENERALLY POSITIVE. LET ME CONCLUDE WITH A FEW ILLUSTRATIONS OF WHAT I MEAN:

(1) OUR TECHNOLOGICALLY-ENHANCED REGISTRATION PROCEDURES HAVE REDUCED INEQUITIES BY IMPROVING ACCESS TO THE

. . . 8/

UNIVERSITY, THEY HAVE ENHANCED INDIVIDUALITY BY OPTIMIZING STUDENTS' CHOICE OF COURSES, AND THEY HAVE FOSTERED INTERPERSONAL CONTACT BY BRINGING TOGETHER GROUPS FROM DIFFERENT AREAS OF THE UNIVERSITY (REGISTRAR'S OFFICE, COMPUTER CENTRE, ACADEMIC ADVISORS, CONTROLLER'S STAFF, ETC.) WHO HAD NOT PREVIOUSLY NEEDED TO INTERACT AS THEY NOW DO.

(2) OUR TECHNOLOGICALLY-ENHANCED MANAGEMENT SYSTEMS HAVE PROVIDED OPPORTUNITIES FOR BOTH ADMINISTRATIVE AND CLERICAL STAFF TO GET OUT OF THEIR OFFICES AND MEET WITH OTHERS AND TO SPEND MORE TIME ON LESS ROUTINE TASKS THAT REQUIRE THEIR IMAGINATION AND JUDGEMENT.

(3) OUR TECHNOLOGICALLY-ENHANCED TEACHING APPROACHES IN DISTANCE EDUCATION HAVE IMPROVED ACCESS AND GENERATED GROUPINGS OF STUDENTS ALL OVER THE PROVINCE, THUS FACILITATING INTERPERSONAL COMMUNICATION AND REDUCING DEMOGRAPHIC INEQUITIES.

(4) OUR TECHNOLOGICALLY-ENHANCED PLANNING EFFORTS HAVE GIVEN CAUSE FOR MORE INTERACTION AMONG STRATEGIC MANAGERS AND HAVE PROVIDED OPPORTUNITIES FOR GREATER DIVERGENT THINKING THROUGH ASKING THE "WHAT IF?" QUESTION.

(5) OUR TECHNOLOGICALLY-ENHANCED LIBRARY OPERATION HAS INCREASED ACCESS TO KNOWLEDGE ON THE PART OF THE SIGHT- AND HEARING-IMPAIRED AND THOSE IN REMOTE LOCATIONS, THEREBY REDUCING INEQUITIES THAT WERE PREVIOUSLY

. . . 9/

UNAVOIDABLE AND REGRETTABLE.

(6) OUR TECHNOLOGICALLY-ENHANCED RESEARCH ENDEAVOURS HAVE LED TO IMPROVEMENTS IN THE QUALITY OF LIFE FOR VIRTUALLY EVERYONE, INCLUDING (IN THE CASE OF RESEARCH IN THE ARTS) THEIR AESTHETIC DEVELOPMENT.

IN SUMMARY, FOR VIRTUALLY EVERY QUESTION OR CONCERN I MENTIONED EARLIER, I CAN IDENTIFY A BENEFICIAL RESPONSE AS A RESULT OF TECHNOLOGY APPLICATIONS AT THE UNIVERSITY OF WINNIPEG - AND I SUSPECT THAT THIS EXERCISE COULD BE REPLICATED ON CAMPUSES RIGHT ACROSS THE COUNTRY.

CONSEQUENTLY, YOU CAN REST ASSURED THAT UNIVERSITIES WILL CONTINUE TO USE AND PROMOTE TECHNOLOGY; AND I CAN ALSO GUARANTEE THAT WE SHALL CONTINUE TO SERVE AS OBSERVERS AND CRITICS OF TECHNOLOGY. TO THE EXTENT THAT OUR APPLICATIONS OF TECHNOLOGY SATISFY OUR CONCERNS ABOUT IT, I SUBMIT THAT WE ARE SHOWING SOME LEADERSHIP THAT THE BUSINESS SECTOR MIGHT WELL EMULATE. AND ON THE FLIP-SIDE, WE SHALL BE BENEFITTING FROM THE EXPERTISE OF THOSE WHO ARE PROVIDING LEADERSHIP IN INFORMATION-PROCESSING.

FOR THAT, ON BEHALF OF ALL UNIVERSITY PRESIDENTS, I THANK YOU.